modern tests

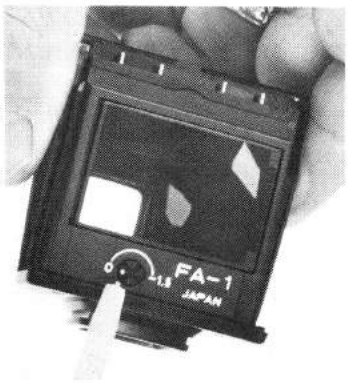
newest cameras, lenses & important accessories

PENTAX LX: NEW CHALLENGE TO NIKON

TYPE: 35mm eye-level single-lens reflex camera. Body No. 5215531. LENS: 50mm f/1.4 Pentax-M, No. 6081018, in interchangeable Pentax K bayonet, stops to f/22, focusing to 18 in. SHUTTER: Electromechanical titanium focal-plane with auto-exposure speeds from 125 sec. to 1/2000 sec.; manual speeds 4 sec. to 1/2000 sec. controlled mechanically from 1/2000 sec. to 1/75 sec. plus B, FP, X sync. VIEWING: Interchangeable eye-level prisms with interchangeable screens have central split-image rangefinder, microprism collar full-focusing screen, color-coded LED viewfinder exposure control with auto-exposure-compensation warning, overexposure warning signal, shutter speeds and apertures, flash ready and O.K. visible. OTHER FEATURES: Two 1.5-volt silver-oxide or manganese batteries power silicon photodiode metering circuit with single cell in mirror chamber, reading center-weighted exposure from first shutter curtain and/or film for both continuous light and electronic flash measurement, ASA 6-3200, aperture-preferred auto-exposure, ±2 f/stops auto-exposure compensation, built-in eyepiece diopter correction, shutter release and shutter dial locks, film box reminder slot, mirror lockup, depth-of-field preview, gaskets to minimize dust and moisture entry, provision for multiple exposures, self-timer, provision for accessory motor drive, winder, data backs, bulk film magazines, hand grips, interchangeable strap fasteners. PRICE: $1085 with lens and finder.

Pentax cameras have been used by professional photographers ever since the first eye-level-viewing model of 1957. But other camera manufacturers, principally Nikon and Canon, have catered most continuously to the pros 'and advanced amateurs' need for a complete system camera featuring interchangeable finders, screens, motor drives and bulk film backs.

True, Asahi Optical has nodded in their direction with a limited series of pro-capable cameras having motor drives to fit special models of the Pentax Spotmatic II, F, ES II, KX and K2 DMD cameras. Neither screens nor finders, however, have



Phillips-head tool helps you adjust diopter correction while you look through finder. Note four electric sync contacts at front end of prism.

been interchangeable. Motor drive speeds have hovered in the 2- to 3-fps vicinity rather than in the professionally-needed 5-fps range. By the time Pentax, in 1976, readied the full-fledged professionally-oriented, mechanically-based MX camera system, prospective purchasers were starting to drift towards fully-automatic, electronically-controlled cameras. Hence, Pentax was forced to begin again a search to the professional's and serious amateur's heart.

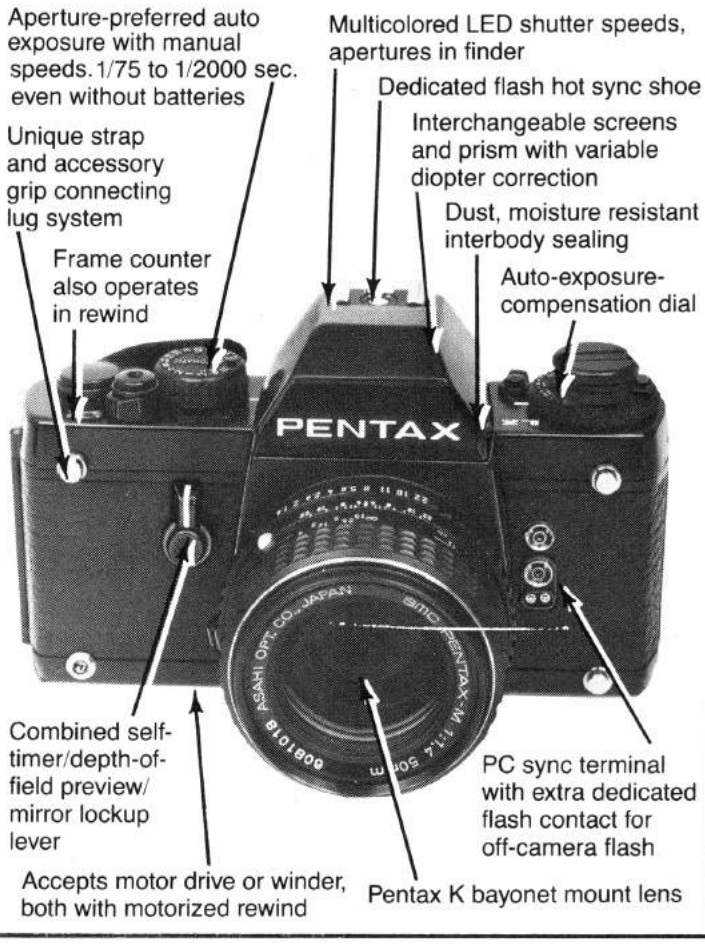
The new Pentax LX represents the fruits of some five years of research by Asahi's engineering and design group among photographers and photo technicians throughout the world as to what they wished in a camera system. From specifications, the LX and its accessories certainly strive for a completeness, sophistication and degree of ruggedness and solidity inherent in few other SLRs. We'll see how well they measure up.

Just where in the camera hierarchy is the Pentax LX aimed? Judging from its features plus complete system, right at Nikon's best.

In body size and weight, the Pentax LX falls midway between the Pentax MX and the Nikon F3. It is an aperture-preferred auto-exposure camera (you select the aperture and the meter system determines and sets the shutter speed) with full manual override. While the metering system, auto-exposure speeds plus manual speeds from 1/60 sec. depend on the well-being of two 1.5-volt silver or alkaline manganese batteries housed in the camera bottom, manual speeds of 1/75 sec. (X-sync) upwards are all mechanical, so they can be used when the battery is too cold, too weak, or absent—a feature not available on any other current electronically-controlled SLRs. In auto-exposure mode, the LX claims a formidable speed range of over 125 sec. to 1/2000 sec. while manual speeds range from 4 sec. to 1/2000. The meter system is unique, in that it uses but one single silicon photodiode centrally located at the bottom of the mirror chamber. This single cell faces backward toward the film and measures the light before and during the exposure from a patterned reflective surface on the first shutter curtain and/or the film itself. In this, it seems somewhat akin to the metering system of the Olympus OM-2. However, unlike the OM-2, it does not have separate cells in the prism housing reading the focusing screen for manual operation and finder information. Instead, 15 percent of the light entering the camera through the lens is transmitted through a semi-silvered, trapazoidal-shaped central section of the rapid return mirror. From there a folding secondary reflecting surface, hinged to the main mirror, redirects the light to the silicon cell (see drawings, page 94). It is this arrangement that provides constant meter information to the viewfinder. When the shutter release is pressed, the secondary surface flips upward against the main mirror and both swing upwards, allowing the light from the lens to strike the first shutter curtain and/or the film itself. Thus you get center-weighted, film-plane readings for auto-exposure when shooting under continuous light or by electronic flash. This system is quite ingenious, and does away with the possibility that separate cells for viewing may give a different reading or pattern from the auto-exposure cells.

The metering system is not the only unique item on the LX. A glimpse through the viewfinder shows something of the advances seen in the Pentax ME Super, but the LX has gone far beyond that camera. At the right of the viewfinder, but within the picture area, is a vertical shutter-speed scale marked in unusually heavy black numerals (far easier to see than any similar scale we

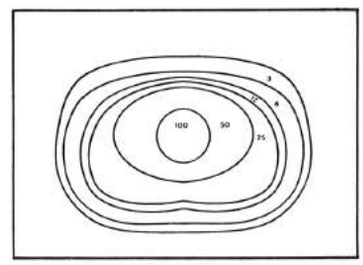
What's New At A Glance: Pentax LX



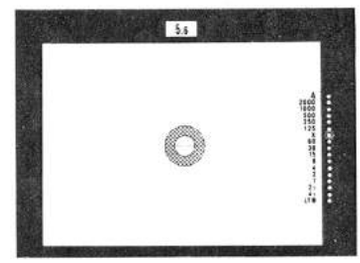
Finder system is most comprehensive of any SLR camera.

know of). Outside the picture area, to the right of the scale, is a series of 16 multicolored light-emitting diodes. The top and bottom diodes are red to warn of over- and prolonged exposures. When you press the shutter release slightly, one or more diodes light for as long as the release is pressed or for 25 sec. afterwards if you remove your finger. Speeds from 4 sec. to 1/15 sec. are yellow, warning that they may blur motion and should be used only on a firm support such as a tripod. From 1/60 to 1/2000 sec. the diodes are green indicating "go," but there's a red diode at the X marking between 60 and 125 to denote X sync. This diode goes on when the special Pentax flash units are ready to fire, and flickers following exposure to indicate that the subject has been given the proper flash exposure. Centered above the picture area is the aperture window in which you see the lens opening you've set, reflected from the lens barrel itself. There are two other finder indicators: a transparent blue indicator covers the top "A" on the shutter-speed scale when the camera is used for auto exposure. On manual, the blue indicator travels downwards over the shutter speed you've set. When you use the auto-exposure-compensation scale, a large transparent red indicator appears above it.

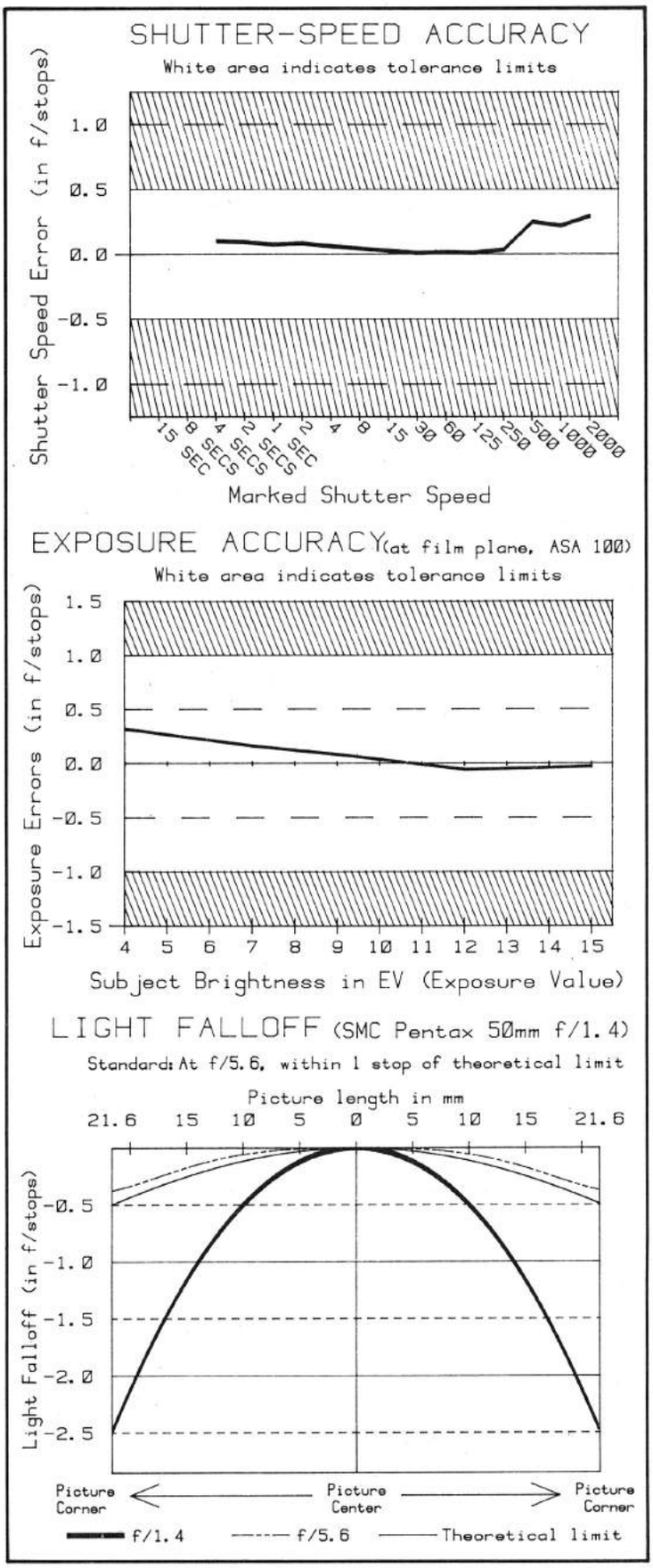
When a dedicated Pentax



Through-lens metering measured from first shutter curtain and/or film itself shows definite center-weighted pattern. Flash metering sensitivity off film, using same cell, provides much the same type of pattern as regular metering.



Viewfinder shows shutter speeds in colored LEDs, aperture, manual-speed pointer, auto-exposure-compensation flag, split-image rangefinder with microprism collar.



GENERAL PERFORMANCE

Checkpoints	Our Standard	As Tested
FINDER:		
Apparent viewing distance	Between infinity and 20 in. (0.5m)	31 in. (0.8m)
Apparent distance of shutter-speed scale	Between 51 in. (1.3m) and 22 in. (0.56m)	31 in. (0.8m)
Apparent distance of aperture scale	Same as above	20 in. (0.5m)
View area compared to film area	Vertically and horizontally more than 90%, less than 100%	Vertical: 97% Horizontal: 94%
Parallax error compared to film	Vertical: 0.36mm Horizontal: 1.08mm	Vertical: 0.1mm (down) Horizontal: 0.15mm (right)
Focusing accuracy at maximum aperture	Within depth of focus	no discrepancy
Image magnification	0.90 ±0.1X	0.80X
PICTURE SIZE:	24 ±0.6mm x 36 ±0.9mm	24.3 x 36.2mm
SHUTTER:		
Curtain travel evenness	±0.33 stop	0.07 stop
Camera insulation from sync	More than 7 megohms	Infinity
Sync contact efficiency	More than 60%	94%
Synchronizer delay time	X: within full opening	Okay
Shutter curtain bounce	Not allowed	None
Self-timer delay time	7-15 sec.	11 sec.
LENS:		
Focal length	50mm ±5%	50.00mm
Maximum aperture	f/1.4 ±5%	f/1.42
Distortion	±2.5%	less than 1.0%
CAMERA SIZE:	Body: 5¾ in. wide, 3½ in. high, 2⅛ in. deep (146.0x90.0x56.0mm) Lens: 2½ in. diam., 1½ in. long (63.0x37.0mm)	
WEIGHT:	Body: 20 oz. (570g) with FA-1 finder Lens and batteries: 8.0 oz. (236g)	

modern tests

Accessory grip fastens to right side with a coin edge—but then you can't carry camera horizontally with neckstrap.

electronic flash unit is slipped into the accessory shoe of the camera and has recycled completely, the red X-sync diode glows. If one of the Pentax dedicated through-lens-measuring flash units is attached, the red X will flicker if there has been sufficient flash illumination during exposure.

The camera body itself consists of a single main (metal alloy) casting of unusually heavy construction. While various controls—such as the wind lever, shutter-speed dial and auto-compensation dials—are of plastic, all major parts of the camera body are of metal. The exterior is finished in black with a fine-grained, leather-like covering material. The LX is one of the few cameras to dispense with the traditional carrying strap eyelets—and instead has a specially designed accessory lug system, allowing the camera to be carried horizontally or vertically. The lug system also provides the support for accessory hand grips.

The LX has interchangeable finders and screens—not too surprising in a camera of this level. But the LX eye-level finders have dedicated hot-sync shoes, which is not only unusual but unique in interchangeable-prism cameras.

The special grommetting and sealing against dust, dirt and moisture are immediately evident upon removal of the prism or opening the camera back. Where ordinary felt-like, or sponge, light-tight sealing material is generally used, the LX has soft plastic seals, or rubberish, O-ring material. (Later on when we disassemble the camera to check parts for ruggedness, we'll peek inside to see if they've carried out further weather sealing.)

The Pentax LX is unique in offering random-access multiple-exposure capability. Not only can you make multiple exposures on top of the shot you have just made, but you can rewind back along the roll and multi-expose any shot previously made—thanks to a frame counter that not only advances when you wind but also reverses as you rewind.

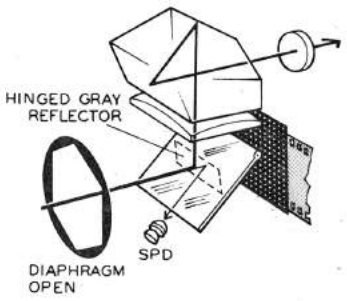
The measure of any camera which considers itself part of a system suitable for professional use is obviously the sum of its parts. A camera which operates fantastically with magnificent lenses may well be far less useful and desirable to a serious amateur or pro than a camera which is less attractive with average pro-quality optics but that has a complete system of winders, motors, finders, special backs and lenses. We therefore intend to give you our opinions on the LX parts. How well does the camera behave on its own, how well with specific accessories, and lastly how well as part of the total system?

We did not find anything extraordinary about the LX's loading system—it is no more complex or sophisticated than the Pentax MX's. You pull up on the rewind knob, the back flies open and you insert the film leader into the very convenient multiple-needle take-up spool now common to all ME, MX and MV cameras. Winding film follows the normal pattern with the plastic-tipped rapid wind lever jutting out some 25° when in the operational standoff position. The 120° winding motion can be made in one single motion or several smaller movements. Many testers did not find the shape of the wind lever as comfortable as on other SLRs—the tip seems to press against the ball of their thumbs. However, certain controls like the wind lever will be available in Japan in several interchangeable configurations, so we expect these will find their way to the U.S.

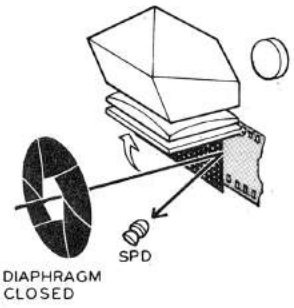
Winding on film to the first exposure is done as in most SLRs. If you leave the lens cap on or are loading in low light with the camera set to automatic exposure, you may initiate rather long exposures when you're really trying to wind to first exposure as quickly as possible. There are two remedies. Wind to the first exposure with the lens cap off and the camera pointing to an adequate light source, or switch to a manual shutter speed. The first is preferable since we found far too often that after switching to a manual speed we forgot to switch back again to auto-exposure operation. The blue manual shutter-speed indicator in the viewfinder simply wasn't a sufficiently outstanding warning to us. A blinking M would have been preferable (or better still, allow the camera to wind to exposure 1 manually even when on the automatic setting).

In rewind, the Pentax LX surprised us by having a distinct ratcheting noise which didn't please us until we discovered that the noise ceased as soon as the film leader was released from the takeup spool. In this

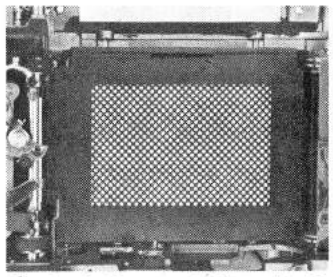
The LX meter—how it works



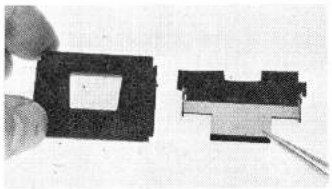
For viewfinder exposure information, 15 percent of light from lens is transmitted through mirror to hinged secondary gray reflecting surface and thence to silicon cell facing film plane, but. . . .



. . . . when shutter release is pressed, mirror and secondary surface flip out of way. Cell reads reflected light from first shutter curtain and/or film itself for continuous-light or flash auto exposure.



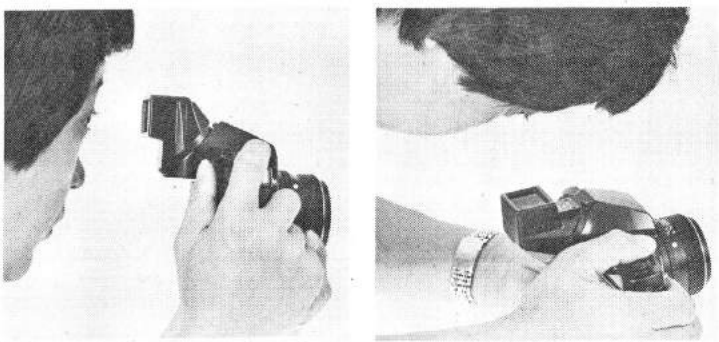
First shutter curtain reflecting surface has overall pattern, but silicon cell reads center-weighted area.



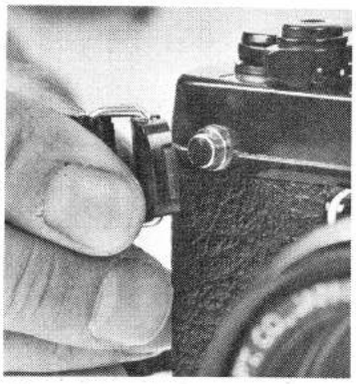
Entire rapid-return mirror passes 15% of light through, but central area (left) has cut out to allow light through to hinged dull chrome reflecting surface (right) that passes light to single silicon cell.

FB-1 finder base accepts three different finders, shows shutter speeds and apertures, correct right to left, unreversed image.

Replacing screens from inside mirror box requires special furnished tool plus care.



FC-1 variable eye-level/waist-level action finder shows full image when your eye is at a distance from camera.



Cleverly-thought-out swivel-type fastener for neckstrap attaches to camera body lug.

manner the user can immediately stop winding and remove the film with the leader protruding, a distinct advantage for those of us who don't want to rewind the film completely into the cartridge but have done so all too often by pure accident.

Before using the camera, you should adjust the viewfinder diopter correction, even if you have never used correction on any SLR you've operated before. Why? The built-in diopter correction of the FA-1 finder commonly furnished with the LX allows you to fine-tune the focusing as you might fine-tune a high-performance race car. You slide the prism backwards slightly after unlocking it with the convenient latch. At the bottom of the prism, toward the back, you'll find a Phillips-head screw with a white dot and a white-lined dial running from 0 to −1.5. If you have normal 20-20 eyesight or better, and are not near- or far-sighted, you would imagine that a zero setting would be correct for you. It probably won't be. Most SLR finders deliver about a −1 diopter correction built in. Therefore, if you see perfectly in other SLRs, you will probably wind up turning the screw about ⅔ of the way toward −1.5. Just look through the viewfinder at a plain white surface with the lens removed and turn the screw with the small tool furnished with each camera. Adjust until the shutter-speed scale and outline of the split-image rangefinder are crystal sharp. Then push the prism back to the lock position. The finder is now just right for your eye alone. Anyone else using the camera should go through the same procedure if he/she wants maximum focusing ability. One of MODERN's far-sighted field testers who usually requires a +1 diopter correction on SLRs he uses, found that a near zero setting was perfect. However, if you are more far-sighted you may need additional plus correction. In this case you should purchase the camera with the FA-1W finder having a diopter correction from −3 to +1, about $10 additional. This amount of correction will probably be sufficient for most photographers. However, if your needs are still beyond this range, additional diopter correcting eyepieces can be slipped over the viewfinder eyepiece.

We were most impressed with the variable diopter correcting system, which certainly gave us far more ability to achieve pinpoint-sharp finder focus than would the camera alone plus fixed diopter accessories. We have never seen a finder screen more clearly—and this should certainly translate itself into more sharply focused photos in the long run for most of us.

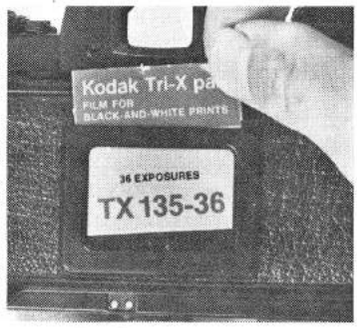
If you've correctly loaded your two 1.5-v alkaline manganese or silver-oxide batteries into the bottom battery chamber, and pushed the shutter release lock lever to the off position, you can now press the release gently and look at all the pretty diodes in the finder (which we've already described). Like all Pentax diode systems, only one LED will light at a time for auto exposure, even though the precise infinitely variable speed will usually be set by the meter circuitry somewhere between the numerals. This is a deliberate bit of electronic engineering to prevent the confusion that is sometimes created in other SLRs with two diodes on at the same time or perhaps one on and one flickering. In average illumination conditions—bright lights indoors or shade or overcast—the diodes, plus the aperture re-

Auto-compensation dial release button has lever on collar that allows prism to be removed easily.

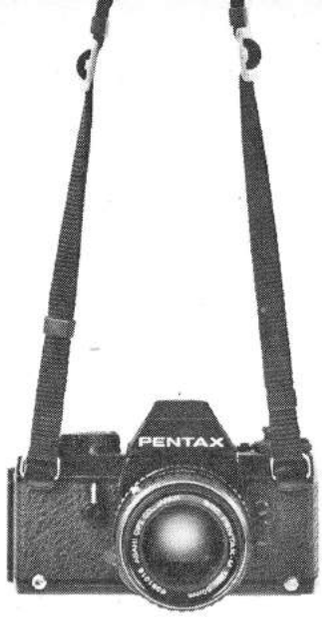
flected from the lens barrel, the blue manual shutter-speed pointer and red auto-exposure-compensation flag can all be seen quite easily. When light overhead is poor, however, the apertures can become difficult or impossible to see. The diodes are not as outstandingly bright in sunlight and must be observed carefully. The shutter-speed scale can be hard to read in very low-light illumination but Pentax has again added a unique feature. The shutter speed numerals have a very high golden reflectance on top so that the least amount of illumination from the rear through the finder causes the entire scale to be lit by reflected light. You will have to play around with this feature until you catch the hang of illuminating the scale from the finder side. However, even if you're photographing in near pitch darkness, the color-coded LEDs will indicate whether you have a hand-holdable shutter speed or not.

Because the LX is a professional and serious amateur camera, the makers think it will have more prolonged and constant use than other Pentaxes. Accordingly, they have suggested that the battery life will be only several months, unlike the optimistic (and usually incorrect) instructions for other cameras that state one year is a proper lifetime. We found the recommendation to be quite accurate, so LX owners should keep additional batteries handy at all times. The addition of a winder or motor does not couple the battery juice from these accessories to the camera exposure system or shutter.

If some 15 percent of the central illumination from the lens travels through the semi-transparent rapid-return mirror center to feed the metering cell, doesn't the availability of just 85 percent going through the finder cause a loss in viewing illumination? Not a bit of it. Because of the Pentax LX's excellently-designed viewing



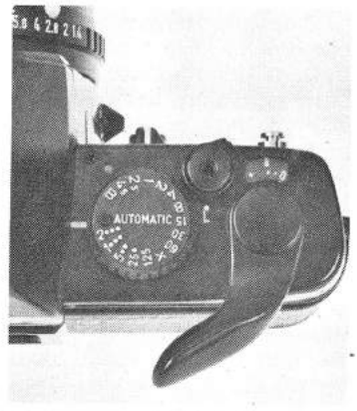
Of course the LX has a film box end reminder slot. Note two contacts below for data backs.



Novel neckstrap system allows LX to be transported either horizontally or vertically.

system, which involves much silver coating of surfaces, the brightness is excellent.

The image magnification within the viewfinder is less than that on many amateur-oriented cameras. However, this is in keeping with other professionally-oriented cameras, such as the Nikon F3, where viewfinder informational material is located outside the picture frame. In the Pentax, the aperture window, light-emitting diodes and the entire viewing screen can easily be seen even by eyeglass wearers (al-



Shutter-speed dial is clearly marked, easy to see in bright light but more difficult in low light. Note wind indicator window next to 4-sec. numeral.

though, admittedly, switching your eye from the top aperture window to the side shutter-speed scale is not as convenient or comfortable as having all information in one place). The central rangefinder and microprism, almost identical in size and construction to that on the Pentax ME Super, were easy to use with all lenses having apertures of f/5.6 or larger. For smaller maximum lens openings as on other SLRs, it's necessary to focus with the outer fine-focusing area.

modern tests

Push central button, press lever inwards and mirror locks up, lens (when mounted) closes to preselected aperture.

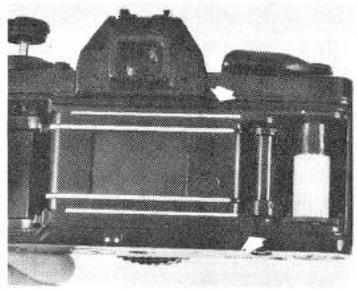
The shutter-release button has a fairly long (5mm) travel. It's a very smooth mechanical control, deliberately not made electromagnetic so that it can still operate at the mechanically available 1/75 sec. to 1/2000 sec. shutter range when batteries fail or are unavailable. Shutter and mirror noise are about average for an SLR. Oddly enough, unlike most SLRs, the actual sound of the shutter speeds from 1/60 sec. to 1/2000 sec., are exactly alike. In most SLRs there is a distinct quickening of the sound as speeds are increased. Photographers who do rely on shutter noise to give them a rough indication of the speed will not be able to do so with the Pentax LX.

The metering system is, in our opinion, the most sophisticated on any SLR today. While we do have a number of SLRs now with off-the-film, through-lens auto-exposure control for continuous light and/or flash, the LX is the only one to use but a single cell within the mirror chamber for all exposure measurements.

Our practical and laboratory tests on the metering system were satisfying indeed, with highly accurate lab readings obtained and well-exposed 35mm slides made in field tests.

The Pentax LX has a convenient auto-exposure-compensation dial with ± 2 f/stop auto-exposure variation. This total range is available from ASA 25 to 1600 with slightly less compensation at ASA 6, 12, 1600 and 3200. We considered this more than ample. As an alternative to auto exposure, you can of course use manual speeds from 4 sec. upwards (or from 1/75 sec. in case batteries fail). With battery power, the LEDs within the finder will continue to indicate suggested shutter speeds for any aperture set. The light blue transparent pointer will indicate the shutter speed you select. Bracketing exposures using this method of exposure determination is very convenient.

The LX does not have an exposure memory hold to allow you to make a close-up reading of a subject, "hold" it while you return to camera position and then release the shutter. This is not an oversight. Cameras offering through-lens flash and continuous light measurement from the shutter curtain and film itself do not have memory hold electronics because they don't need them. Cameras not using off-the-film measurement for all auto exposure need a memory which "locks" the exposure before the mirror flies up and "holds" it until the exposure is complete. Exposure measurement with cameras such as the LX is continuous, even after the shutter is released. Thus a change in lighting can alter exposure during the actual exposure itself—a most useful feature during long exposures—



Multi-needle covered takeup spool makes loading easy. Note retractable mask for accessory Data LX clockface. Arrow points to dust-, moisture-resistant gasket.

such as at night, where the illumination might suddenly change. The LX metering system accommodates this kind of change; cameras with memory hold electronics cannot.

Because the Pentax LX measures all exposures using the single backwards-facing silicon cell in the mirror chamber, no extraneous light from the viewfinder affected either our manual or auto-exposure readings. No viewfinder blind was needed. Additionally, focusing screens and finders could be interchanged without exposure compensation.

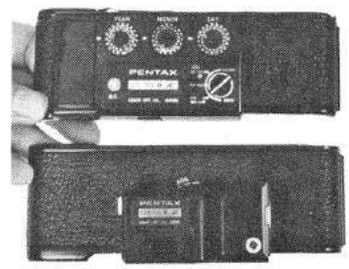
While finders can be changed with alacrity, we found screens must be interchanged carefully from within the camera mirror chamber using a specially furnished tweezer-like pincer. Why not change from on top? Because there's a fixed surface which has the shutter-speed scale engraved thereon and is non-interchangeable. Finders are taken off on top and screens removed from below but the shutter scale surface remains fixed.

When using standard polarizing filters, we noted that pre-exposure readings were often inaccurate, because metering systems transmitting light through a semi-transparent surface do not give proper readings through polarizing filters (unless the filters themselves are of the quite expensive so-called circular types, such as those made by Leitz). However, thanks to the direct off-shutter film-reading metering system, the actual exposures made through all polarizing filters with the LX were quite accurate.

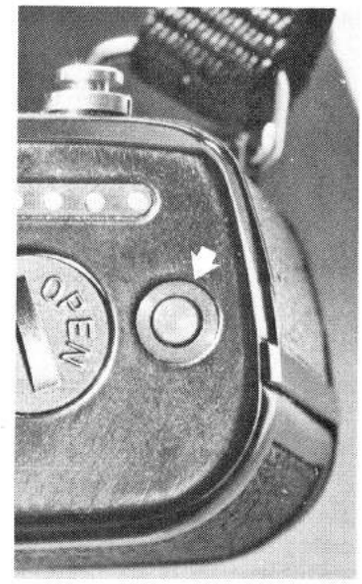
The Pentax LX has quite an amazing range of auto-exposure speeds, according to specifications and as confirmed by our tests. Should you be using Kodachrome 64 for a night shot, for instance, the metering system can provide an accurate auto exposure of over 4 min. at f/1.4! (If you are using a film requiring reciprocity-failure correction, you can make a first exposure, time it and then make your filtration correction and your exposure correction using the auto exposure compensation dial.) As higher ASA speeds are used, the longest exposure possible does become abbreviated. With an ASA 400 film, for instance, an exposure of about 50 sec. is maximum according to our tests. Manual-shutter-speed exposure couplings are somewhat more restricted, due principally to the lack of any manual speeds over 4 sec.—but what camera other than the LX has any manual speeds that long to begin with? In all, it's a most impressive, thoroughly professional, highly flexible metering system with a peerless range.

The multiple-purpose lever at the front of the LX is well thought out. Push the center lever button and turn the lever away from the lens mount and you have a 12-sec. self-timer (which can be set for shorter periods). Once set, it is still cancellable instantly simply by turning the lever vertically again. While the timer is mechanical, not electronic (and therefore works with or without battery power), it has a prominent white stripe down its length—so that by its position the subject can be warned when the shutter is about to be released.

Push the lever toward the lens mount and it will instantly stop down to your present aperture so you can view the depth

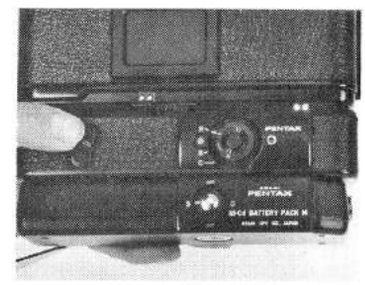


Dial Data or Data back (with watch face) are similar to those available previously for special Pentax models.



Rubberized round spot (arrow) supposedly prevents camera from sliding on smooth surface but it doesn't. Note four electrical contacts for winder or motor drive.

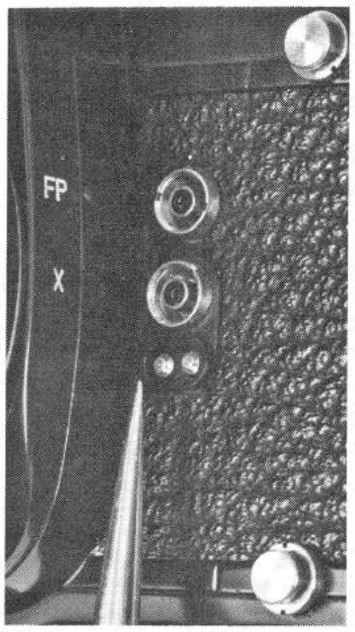
of field. Press the center button and push the lever if you want to stop down the lens and simultaneously raise the mirror to the locked-up position for very delicate, vibrationless work such as astrophotography or photomicrography. We did come across one fascinating feature here. The LX is the only through-lens-metering camera that can make automatic exposures in flash or continuous light with its mirror locked up! While admittedly you can't view



NiCad battery pack fits horizontally beneath Motor Drive. Controls are versatile but simple to use.

your subject with the mirror locked up, you can check the exposure since the aperture window is still visible in the finder and you can generally see the entire aperture scale (plus the diodes, of course) lit by viewfinder-reflected light as we've already described. So if you have your camera on any rigid support and the subject isn't a moving one, you can easily make use of the most vibration-free auto exposure available on any camera.

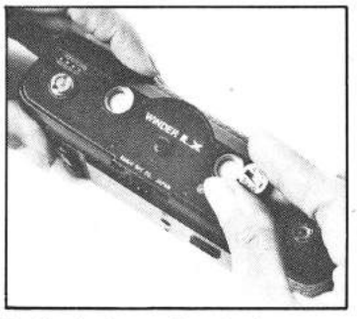
We don't wish to imply by our concentration on the rather versatile mirror-lockup and exposure system of the LX that using the LX with its rapid-return mirror operating is vibration-prone. It is not. What we first thought of as rather excessive



What are two additional contacts below X-sync PC terminal? For off-camera dedicated flash sync cord.

camera movement caused by the shutter mechanism turned out to be caused totally by the rapid-return mirror returning to down position following exposure. Shutter release, first shutter curtain travel and mirror raising are remarkable in their smoothness and lack of effect on the camera itself.

We've left the LX with its mirror still locked upwards and its lens closed down. To return the mirror and lens diaphragm to normal viewing, just push the lever's center button, and it



Both winder and motor have receptacles to store covers from wind and rewind shafts when motor or winder is attached.

occurs immediately.

The lens-mount system of the LX barely requires mentioning, since it's the now very well established and accepted Pentax K bayonet. As might be expected of a pro camera, the LX's lens-mount face ring is of stainless steel, a more preferable metal to the usual brass since the steel wears far less under heavy continuous use. As with other cameras using the K mount, we found lens interchangeability swift and efficient with no loose play.

While once we were quite satisfied with a simple waist-level finder and high-magnification finder alternatives to the furnished prism finders of top-level SLRs, manufacturers have increased our options with other alternatives. The LX goes beyond that with three eye-level prism finders (the FA-1 and FA-1W already discussed), the $82 FA-2 (an FA-1 with no hot shoe or aperture visible in the finder), the FE-1 high-magnification waist-level finder ($140) for close-up and critical focusing work, with diopter correction from −5 to +4, and an FB-1 system finder. The FB-1 base ($163) fits atop the LX. To it you can attach the FC-1 variable eye-level/waist-level eyepiece sports finder ($83), the FD-1 45° Waist-Level Eyepiece with −5 to +3 diopter correction ($102), or the FD-2 Standard Eyepiece ($44), similar to the FD-1 but without its diopter correction. All FB-1 system finders show apertures and a correct, left-to-right, unreversed image of the entire scene. The FE-1 shows no apertures and the view is reversed. A complete analysis of these would send us into overtime or extra innings. Suffice to say that each is very useful but we feel one eye-level prism and the FB-1 system finder minus the FD-2 standard eyepiece would be all that even the most critical professional worker would ever need. The FE-1, by the way, is excellent for photomicroscopy, where you will be using a cross-hair viewing screen for focusing.

One traditional Pentax indicator that we should not forget mentioning is the quite useful shutter wind indicator, a small window in front of the shutter-speed dial which shows a red signal when the film and shutter are wound, ready for exposure.

Addressing ourselves now to the camera body indicators, we have to give grudging admiration to the new Pentax style of employing raised shiny numerals against a matte black background both on the shutter-speed dial and auto-exposure-compensation dial. With bright overhead illumination they are quite easy to see, but in poor light much less so. While it might indeed look far more garish on the all-black camera, we would prefer a white on black shutter-speed dial—or perhaps even one whose shutter speeds are color-matched to the shutter-speed LEDs within the viewfinder. However, like the shutter wind lever, we have been told that alternative shutter-speed dials will be available on the Japanese market and maybe on ours. All other controls—apertures, f/stops, frame numbers—are highly visible.

Although the carrying strap system is not usually considered a part of the camera proper, the Pentax LX approach represents a complete departure from standard 35mm SLR practice.

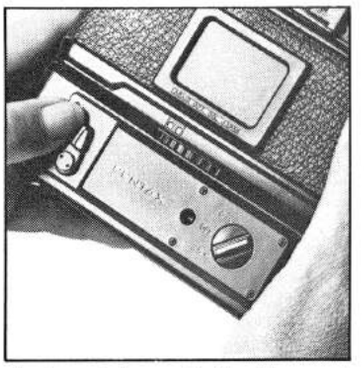
Aside from a few exceptions like Alpa to prove the rule, SLR cameras traditionally have provided small carrying strap eyelets at the camera ends through which some sort of split ring is generally threaded. To these split rings, the camera carrying straps are attached. When camera makers discovered the brass eyelets were wearing through under hard use, steel inserts appeared within the eyelets on new cameras. This carrying system, while allowing many diverse types of straps to be fitted, often proved ineffective in preventing the split rings from somehow unthreading and dropping the camera. Secondly, the split rings themselves often rubbed against the camera, causing abrasions and the wearing of the chrome or black enamel on the camera body.

The Pentax LX does not have eyelets. Instead, there are three accessory lugs at the top edges and bottom left side of the camera. An adjustable, woven nylon carrying strap, ½ in. wide, is provided with a cloth-backed center section 1 in. wide (to prevent shoulder slippage and make camera carrying more comfortable). At either strap end is a swiveling tab fastener which fits over the locks securely against the lug. The camera can be carried horizontally or vertically (see photos, page 95). At the bottom right side of the camera front is a threaded socket. Using the top lug and the socket you can fasten on your choice of two accessory grips—Grip B, which is contoured for the most users ($10), and Grip A ($15), which can be shaped to your own needs with a knife and sandpaper—a nice touch. We found that the Grip B suited most testers' hands well, and the camera was indeed easier to hold with the grip. However, when the grip is attached, the camera cannot be carried horizontally—which might be inconvenient should you be photographing with two Pentax LX cameras carried around your neck, on your chest. Still Pentax must be applauded for at last tackling one of the primitive SLR features and improving it vastly. (Should you prefer some other strap than Pentax's, you can purchase the swiveling fasteners alone for $4 apiece and attach your favorite strap to them.)

In our field tests of the camera we were quite impressed with the Pentax LX (aside from the minor criticisms already voiced). We found that it provided us with a versatility and flexibility hard to match in any other 35mm SLR camera, and in some areas, such as exposure, unmatched.

Let's now turn to flash. The hot shoe on the interchangeable eye-level prisms is a triumph of clever design. In the shoe you may slip the foot of any flash unit with a hot sync foot. However, the Pentax units do offer distinct advantages. The AF 160 and AF 200's dedicated flash available for the Pentax MV-1 and ME Super do automatically set the speed to the 1/75 sec. sync when the LX is on automatic exposure and will also cause the X LED to light when the camera is ready to

Even with bulk film back and AA-cell-powered motor, LX is neat handful. Don't like the vertical grip? Use the NiCad pack.



Just push in rewind button and press lever clockwise for motorized motor or winder rewind.

AF-280T may be bulkier than many SLR flash units, but it has plenty of power with great versatility.

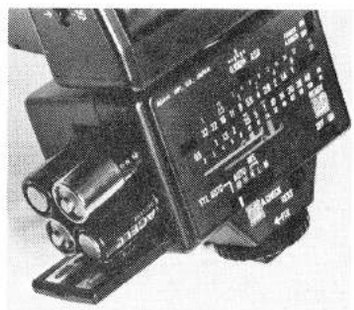
fire. However it is only with the two new flash units, the hot shoe mounted AF-280T ($155), and the head-and-handle shaped, bracket-mounted AF-400T ($382) that you obtain through-lens autoflash metering plus flash O.K. check.

The AF-280T, powered by four AA cells, slips atop the hot shoe and locks in place. The flash head can swivel 90° on each side with 45° indents and can also tilt upwards 90° or depress downward 15° for close-ups. The flash covers the angle of a 28mm lens, while a wide-angle adapter ($8) and tele adapter ($14) allow lenses to 24mm and upwards of 85mm, respectively, to be used with best efficiency.

Unlike the dedicated flash units for cameras not having through-lens flash metering which must be used at specific apertures, the AF-280T can work at any aperture you choose. With ASA 100 film the f/22 exposure range is from 0.8 ft. to 4.3 ft., excellent for close-ups, while at f/1.4 the auto range extends from about 10 ft. to 65 ft. A calculator guide on the back of the AF-280T provides the maximum distance range for any aperture you choose. There is a flash check light on the back of the unit plus the red LED opposite X in the finder which both flicker following exposure if there has been sufficient illumination. (Our early production LX instruction manual claimed that you can check through-lens-metering flash by pressing the auto-exposure check button on the back of the unit, but this is not so. The check button only works with non-through-lens auto flash metering using the flash unit's own built-in direct sensor. This is a separate auto-exposure system which works on the LX or any hot-shoe-sync camera.)

Can you use AF-280T off camera? Sure, with Duo-Sync cord made by New Ideas, Inc.

The manual ASA 25 guide number of the AF-280T is 46 and the ASA 400 guide number is 185. When operating at the TTL (through-the-lens) Auto setting, the flash will only fire if the camera shutter speed as seen in the viewfinder is 1/30 sec. or below. At higher speeds where there is sufficient light to operate without flash, the camera's own auto-exposure system takes over and the flash will not fire. At slower than 1/30 sec., the flash exposure takes into consideration not only the unit's own flash but also all existing light as well.

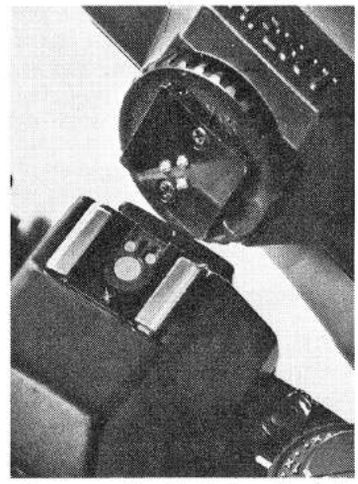


Four-AA-cell-powered AF-280T dedicated through-lens autoflash has complicated calculator, but you don't need it for TTL Auto flash mode.

Besides regular TTL autoflash exposure, the AF-280T has two different aperture ranges for direct auto exposure using the unit's own metering cell plus both full-power and low-power manual operation which work with the flash-ready indicator.

Using any of these four alternatives, the flash-ready X-sync LED still lights, and again you are prevented from shooting automatically or manually at speeds faster than 1/30 sec. However, should you wish to override the whole system and use flash at whatever aperture you wish, there is a full-power M (for manual) setting which allows just this.

The unit operated perfectly for us although we found the 10-sec. manual or maximum auto distance recycling time with fresh batteries to be rather long, particularly when it lengthens considerably as more flashes are used. On TTL Auto however, the energy-saving circuit does cut recycling time considerably, resulting in far more flashes than the 150 minimum which would be achieved either in manual operation or at maximum auto-exposure distances.



Three-contact hot shoe is similar to that on ME Super, MV-1 cameras; but only LX has through-lens flash metering.

We have only one negative comment concerning the flash/camera sync system. If by accident you should possibly turn your shutter-speed dial off automatic and onto a high speed such as 1/2000 sec. and then use the TTL Auto flash setting, the Auto Check signal on the flash unit as well as in the viewfinder would indicate that a sufficient light exposure had been made, even though the truth is that the shutter speed was far too fast to make a flash exposure at all. Why then the flash O.K. signal? It was caused by the flash reflecting from the patterned first shutter curtain, thus providing the exposure check light with a false flash O.K. indication. While, admittedly, photographers shouldn't attempt to shoot autoflash while set to a manual shutter speed, it can and does happen. Some sort of flash-check cut-off circuit which would operate at any speed faster than x sync would rectify the problem.

While Pentax—at least at present—has no flash cord to allow the AF-280T to be used off camera for reflector flash, variation in flash modeling light or using the flash for slide copying, New Ideas, Inc., does make a Duo Sync Cord (see picture) for $19.95 which we found works nicely.

For those requiring more power and the possibility of alternate power sources such as high-voltage packs and AC in a unit specifically designed for off-camera operation, Pentax has the head-and-handle AF-400T flash unit which attaches physically to the LX by a tripod-socket-mounted angle bracket and electrically via a dedicated sync cord. The cord uses the camera's PC cord plus two additional contact points (see photo, page 97) near the side of the lens mount.

The AF-400T head swings and tilts in much the same manner as the AF-280T, has a distance range with ASA 100 film of from 10 ft. to 93 ft. at f/1.4, a manual ASA guide number of 65 for ASA 25 film and 260 for ASA 400. The six AA cells in the handle delivers upwards of 75 manual flashes, the angle coverage is sufficient for a 28mm lens, the unit accepts the same wide-angle and tele attachments as does the AF-280T. Besides the Auto TTL setting, the AF-400T provides a three aperture range for direct autoflash, a manual sync setting with finder flash indication and a full manual operation with no visible indication in the finder. There's also manual light-intensity control with 1/25, 1/16 and 1/4 power settings. At large apertures, the unit can be synched to the camera for motor or winder sequence shots. Regrettably, time and space did not permit us to test this unit out.

Turning now to the LX winder ($258), the word "unique" again is needed. The LX winder, which is powered by four AA cells and, according to our tests, can advance film in single shots or bursts up to 2 frames per sec., is the only winder on any SLR which also offers motorized rewind. (This takes 12 sec. for a 36-exposure roll, according to our tests.)

The winder fits neatly below the camera, but first you must remove the drive and rewind shaft covers from the bottom of the camera and thread them into the two receptacles atop the winder. Why is it necessary to remove two covers when only one cover need be removed on the other SLRs? Remember, the LX is protected against dust and moisture to a greater extent than other SLRs. Should the camera's drive or rewind mechanism connections for a winder or motor be exposed without a cover, the protective sealing would certainly be breached. Covering the camera bottom with two covers does make the bottom moisture- and dust-resistant. Even the four-point electric contact of the winder has a resistant O-ring grommet so that dust or moisture will be minimized in this area. How dust- and moisture-resistant is the camera with the winder attached? Almost as much as without the winder. The two wind and rewind claws which reach into the camera have plastic sealing grommets which work effectively.

With fresh alkaline batteries in the winder we were able to achieve precisely 2 frames per second on continuous bursts. On one set of alkaline AAs we were able to wind and rewind over 40 rolls of 36 exposures.

Besides being activated by the camera shutter release, the winder can be set off by remote control via its electric remote control socket which also allows an intervalometer to be fitted for time sequence studies.

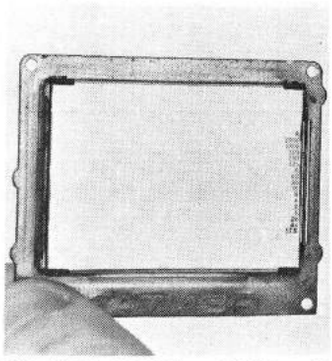
According to specifications, when the winder is operational, there should be 2mm of shutter-release travel between the viewfinder display lighting and the winder operating. We found it most difficult to light the display without setting off the winder. To avoid unwanted exposures we found it advisable to light the display with the winder turned off, and then turn the winder on. Asahi, when contacted, said that this was a fault which should not occur, that it would be investigated and rectified on any cameras reaching consumers, accord to our technicians.

If you attach or detach the LX winder in mid-roll, Asahi warns that there is a possibility of film fog when done in sunlight or under a bright lighting source. We found that it could be safely attached or removed in the same type of minimal light in which you might load or unload film from the camera.

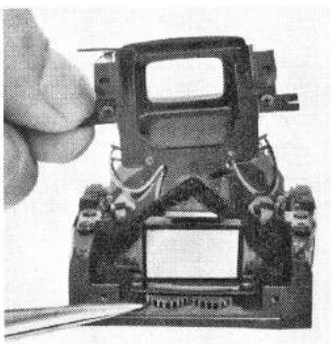
The Pentax LX Motor Drive ($430) can be powered by 12 AA size alkaline batteries in a vertical Battery Grip M ($146) or by means of a horizontal NiCad Battery Pack M ($146) which requires but 6 hrs. to recharge from full discharge using the Charge Pack M ($47). There's also an AC-connected Power Pack M ($242) incorporating a built-in variable-interval timer. The motor fits in the same manner as the winder but offers variable continuous speeds from 0.5 fps to 5 fps plus motorized rewind in 9 sec. (according to our tests). In cold weather either the Battery Grip M or NiCad Battery Pack can be removed from the motor proper and operated from a warm pocket using a remote control cord. Using the motor plus AA-cell hand grip, we were able to wind and rewind more than the stated minimum of 30 rolls of 36 exposures. We do, however, recommend the NiCad battery pack, which will handle over 20 rolls per charge. It eliminates the long vertical battery-holder handle, can operate in colder weather and, if you use the motor with any consistency, will certainly be cheaper than replacing 12 AA size alkaline batteries when they run down. We had only one slight reservation concerning the motor drive. The motor tripod anchor screw holds the top plate of the motor securely against the Pentax LX camera body. But there is no support for the tripod anchor screw except the motor's metal top plate, which it-

Continued on page 144

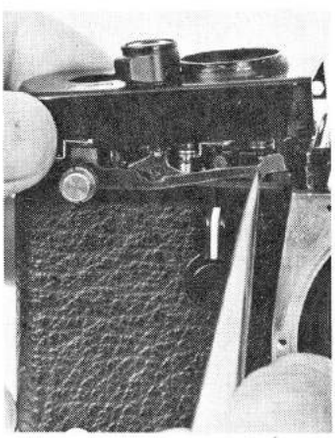
Pentax LX—the inside story



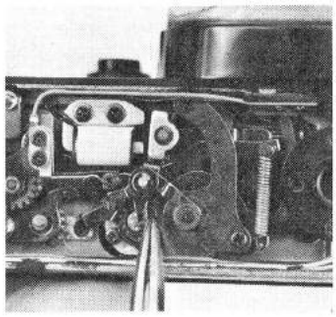
Shutter-speed scale is printed on permanent viewing condenser lens lodged between interchangeable finders and focusing screens.



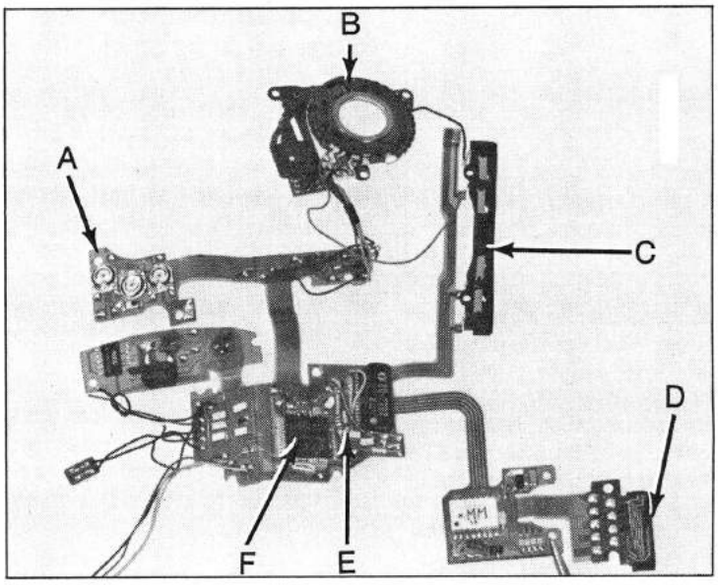
Lifting finder cover away, you see movable diopter eyepiece with geared adjustment.



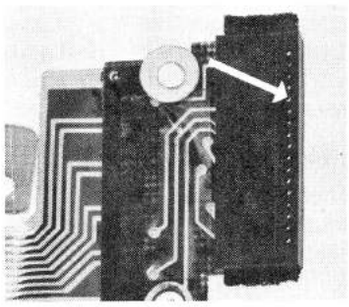
Rubberish compound seals top, bottom plate against dust, dirt. Heavy grease seals rapid wind, rewind shafts.



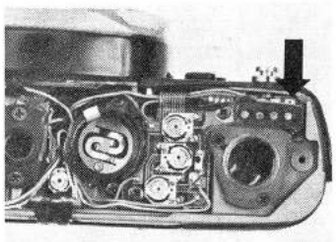
White color electromagnet governs all electronically-controlled speeds above 1/75 sec. at camera bottom. Faster manual speeds are operated mechanically from top of camera.



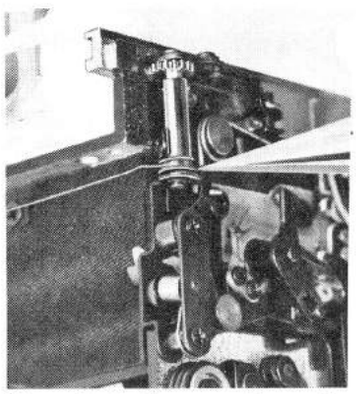
LX's printed circuit board is one of the most comprehensive yet. ASA is set by rheostat (B) which also sets auto-exposure compensation. Technician's fine adjustment controls (A) adjust entire shutter operation. Circuit also features sync contacts (C) for FP and X, finder LEDs (D), by analog-to-digital converter (E). Entire operation is controlled by MOS chip (F) as brain.



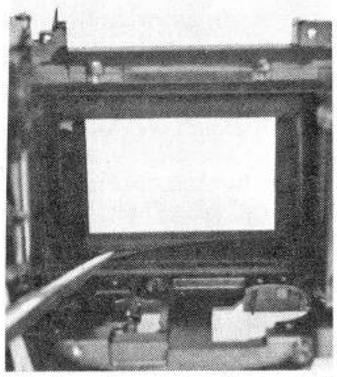
Here's light-emitting diode part of camera circuitry.



Adjustment "pots" are located beneath camera's bottom cover. Arrow shows unused winder contact.

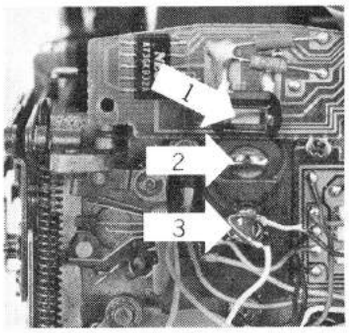


Manual shutter-speed needle (in finder) is controlled by narrow, but strong, all-metal wire (pointer).



Shutter plane is totally sealed against light leaks by focal-plane shutter-type cloth material.

Unique feature: additional unseen light-emitting diode (3) prelights silicon photodiode (1) to provide fastest possible readings for through-lens flash close-ups. Light reflected from shutter curtain and/or film surface is focused on SPD by lens (2).



MODERN TESTS

Continued from page 100

self is held in place by seven very short Phillips-head screws. Should unusual force be applied, especially on the Battery Grip M, it might be possible to strip the screws and tear the motor from the top plate. While admittedly this is a remote possibility, we do feel that, as a safety measure, the screws should be longer and of greater diameter.

AF-400T offers off-camera flash, more power than AF-280T, mounts on bracket held by tripod socket.

The LX motor, like the winder, performed up to all specifications. The braking mechanisms of both winder and motor instantly halted film advance at roll end, thus avoiding any possibility of having film ripped from the supply spool or creating torn film sprocket holes.

Thanks to Asahi's concern that all parts of the LX system should be made available at the same time as the camera, we were able to examine the Dial Data LX Back ($158)—which overprints the date, technical data or filing information directly on the negative or transparency—plus the Data LX Back ($465) which prints the time plus a short message in the center of the clock face. Both of these are long-time Pentax accessories but now have been incorporated into backs to fit the LX. The LX itself already has the necessary swinging film blind built into provide the clock face with a suitable blank spot in one picture corner.

The 250-exposure Bulk Film Back ($652) is somewhat similar to bulk backs on previous Pentax SLRs, but the mechanisms have been improved. It can be used with or without the Motor Drive. Again, time and space did not allow us to test these units.

The Pentax LX camera and system certainly represents a strong challenge to all others in its class. We have pointed out specific teething problems, not an uncommon occurrence for the emergence of a whole new camera system, but none render the camera non-operational. More important, the Pentax's strengths—many of them unique, as we've pointed out—do offer the owner specific advantages in part and sum not available on any other SLR of any class. Although we did not attempt to dunk the Pentax in water or fine dirt to test its dirt-and moisture-resistant qualities (and we don't advise you to either), the sealings do definitely work. While the camera itself appears deceptively simple, it has all any top pro needs and then some. As important for those who have emotional ties as well as objective feelings about their camera, the Pentax LX is likable and enjoyable to use.

Optical bench analysis: On axis, at maximum aperture we detected slight yellow-orange flare and slight overcorrected spherical aberration. However, the flare was greatly reduced by f/2, the lens virtually free of all defects (diffraction limited) by f/2.8 and completely free of all defects by f/8. Off axis, there was some skew-ray flare with slight coma and astigmatism at f/1.4 with all but the astigmatism disappearing by f/8.

Field test slides: While at f/1.4 our slides were slightly soft (mostly attributed to an extremely shallow depth of field even at great distances), slides showed excellent saturation and consistent exposures over a wide range of subjects with excellent crispness and defined detail at smaller than maximum apertures. Very slight blue lateral color was detected.

RESOLUTION

SMC Pentax 50mm f/1.4 at 1:50 magnification				
f/no.	Center Lines/mm		Corner Lines/mm	
1.4	V. Good	50	Excellent	40
2	V. Good	56	Good	40
2.8	V. Good	71	Good	50
4	V. Good	71	V. Good	56
5.6	Excellent	80	V. Good	63
8	Excellent	80	V. Good	63
11	V. Good	63	Excellent	56
16	Good	56	V. Good	50
22	Accept.	56	V. Good	50

CONTRAST

SMC Pentax 50mm f/1.4 at 30 lines/mm				
f/no.	Center %		Corner %	
1.4	Low	34	Low	20
2	Low	46	Low	20
2.8	Low	50	Low	32
4	Low	58	Low	42
5.6	Low	54	Medium	47
8	Low	51	Medium	46
11	Low	48	Medium	44
16	Low	45	Low	39
22	V. Low	38	V. Low	34